Passaic River RM 10.9 Draft Final Design Work Plan, February 27, 2013

NJDEP Comments

Review of the subject document has been completed, along with review of the CPG response to former NJDEP comments, Jan. 25, 2013. Aspects of the Final Design that require further clarification or revision prior to approval are summarized below, under Specific Comments. In addition, several components of Design are still under development by the CPG, including, but not limited to, final cap design and monitoring programs. The General Comment below summarizes several time-critical items for resolution.

General Comment:

At the outset, this TCRA was proposed as a way of not only isolating a region of high sediment contamination in the river, but as an opportunity to design, test and evaluate features of this TCRA (dredging, capping, overall success of same) to inform future remedial actions in this river. For these reasons, it is important to appropriately design and conduct monitoring programs to evaluate the success of this remedial action relative to the original objectives and relative to specific contaminants for which this TCRA was initiated.

Three items of significance that require expeditious development and submittal for review and approval include: the Water Quality Monitoring Plan (WQMP), which is often referenced in the Final Design report, but not included (nor listed among the Appendices); a detailed Perimeter Air Monitoring Plan (PAM); and the Long Term Monitoring Plan (formerly Appendix K).

WQMP- Through review of the 90% Design WP, NJDEP had several specific comments on improved scoping of this work, described in Section 4.6 of Design. Many NJDEP comments are not addressed, as they are deferred to the WQMP, not yet submitted. The TRCA should not move forward without establishment of a surface water quality monitoring program, acceptable to the Regulatory Agencies, that is designed to meet project objectives and is protective of surface water quality in accordance to regulatory requirements in Section 2, ARARs. Two critical outstanding items include the need for specific COPC monitoring (2,3,7,8-TCDD, PCBs and/or other key indicator compounds) in the water column during dredging and resolution on appropriate site-specific TSS and Turbidity Trigger levels and Action levels. These are discussed further under specific comments below.

PAM - The need for a PAM was discussed during the Nov. 29, 2012 project planning meeting between CPG and NJDEP. Section II of the subsequent meeting minutes by CPG initially indicated that CPG thought the Department was only concerned with management of odors. We reviewed the minutes and corrected them by clarifying that perimeter air monitoring during dredging activities needs to be performed for key project contaminants such as dioxins, PCBs and Mercury. CPG acknowledged this concern, would consider it, and seek NJDEP input, if needed. Former NJDEP comment 30 on the 90% Design report also stated this need. It is noted that Appendix G, CHASP, Section 4.7, provides a good perimeter air monitoring program framework for managing potential emissions of VOCs, H_2S and dust/particulates. In addition, monitoring for COPC is mentioned but not described. Further comments are provided below.

Long Term Monitoring Plan - Appendix K was not included in the Final Design Submittal. Based on review of the CPG response to comments, former NJDEP comments have not been addressed, but could be addressed in a forthcoming plan.

Recommendation : a. The following document should be consulted for development of the WQMP and the Long Term Monitoring Plan, "*Long Term Monitoring Strategies for Contaminated Sediment Management, Final Guidance Document*", February 2010, US Navy, as it provides useful direction and tools for these programs. b. Both the WQMP and PAM programs could be submitted in one document, perhaps the Construction Environmental Monitoring Plan (former Appendix E; never submitted and not included among Final Design documents, Feb. 2013). c. An updated Appendix K is needed, as features of long term monitoring are affected by design and implementation of the TCRA and therefore require development at this time. The status of Appendix K is requested.

Specific Comments

(1) Response to Former DEP comments 4b, Word comment 7 (RTC, page 3) - In response to specific NJDEP recommendations on improving Section 4.2 and design/long term success of the cap, the CPG provides a broad statement re-iterating the scope of the TCRA, without regard to the specific conditions mentioned in the original comment. At a minimum, the CPG should address the site conditions described in NJDEP's comment by describing how current TCRA components are designed, or may be modified, to mitigate this issue.

(2) CPG Response to Former DEP general comment, Word comment 1, and statements made in Sections 4.4.1 (page 4-6) and 4.4.4 (page 4.9) - CP G concludes that potential impacts to surface water quality resulting from the dredging-associate d release of dissolved and colloidal contaminant fractions are not expected. Although this may be the case, it is unknown until tested with appropriately designed sampling. Due to the short duration of this dredging project, the following recommendation is considered *optional*, but would provide useful information for future similar remedial actions in this river. If, through the existing surface water monitoring program, the "total" COPC constituent concentration s are found to exceed their associated NJ Surface Water Quality Standard, contingency sampling for the dissolved contaminant fractions of metals, and low molecular weight PCB congeners and PAHs, could be implemented. To accomplish this, extra sample volume could be collected and held pending initial sample results.

(3) Response to Former DEP comments 6, Word comment 9 (RTC, page 4) and Section 4.4.1, page 4-6 - The DREDGE Model input parameters assumes dredged material loss rates of only 0.5% and 1%; CPG quotes USACE (2008) to support the use of these sediment resuspension factors. However, USACE (2008; page 160) also includes the following caveats:

- "Actual resuspension would deviate from the charact eristic resuspension as actual site, sediment, and operating parameters deviate from characteristic conditions."
- "... the characteristic resuspension factors should b e increased by a factor of two or three for environmental dredging sites when significant quantities of debris are encountered."
- "Additional resuspenson will occur from supporting activities such as debris removal, barge/pipe/silt curtain tending, barge/dredge transport (tug operations),

and crew operations, which should be included in the overall estimate of resuspension."

Thus, the use of 0.5% and 1% resuspension factors are probably not "conservative" and may underestimate (to an unknown degree) the actual sediment that is resuspended in the dredging area.

The DREDGE model results presented in the Draft Final Design Report also assume 0 mg/L TSS as the background in the water column (CPG Response to Comment #6). Thus, the TSS values presented in Table 4-4 are additional TSS that should be added to the average background TSS levels in the water column to evaluate the potential effects of the dredging operation. CPG Response to Comment #15 provides an average background TSS level of 28.9 mg/L. Thus, the data in Table 4-4 indicate that at a distance of 200 meters and 1% sediment resuspension, the additional TSS of 23.1 mg/L resulting from the dredging operation will almost double TSS levels in the water column. This information should be taken into consideration for refining the dredging and monitoring programs.

(4) Response to Former DEP comments 13, 11a and b, 14a and b (RTC, pages 5-7) - NJDEP suggested COPC monitoring for key chemical indicators during dredging operations. CPG state that "COPC sampling cannot be collected and analyzed in a timeframe that will allow real-time management of dredging operations." NJDEP understands the project constraints; however, monitoring performs two functions. The first is to provide appropriate feedback to adjust the remedial operations to protect surface water quality, and the second is overall monitoring to document a) environmental conditions during the operation and b) attainment of ARARs. There are measures that can be taken to meet these functions:

Option 1: Review the 2009- 2010 RM 10.2 data to see if there is a usable correlation between turbidity, TSS and key chemical constituents. If so, during the planned baseline monitoring, collect 2-3 rounds of these three parameters together to verify this correlation. Once reviewed and approved by the regulatory agencies, this information may prove useful for limiting the amount of chemical constituent sampling needed during dredging and capping operations. If a reliable correlation is not shown, a more intensive chemical constituent sampling program is needed.

Option 2: During initial dredging work, collect strategic co-located samples for TSS, Turbidity COPC (dioxin/furans, PCBs, mercury) and POC (particulate organic carbon) and run analyses on an expedited basis. This information may allow development of a correlation between these characteristics (TSS-Turbidity-COPC-POC) during active dredging to enable subsequent monitoring to rely on real-time measurements of Turbidity and/or daily or weekly measurements of TSS, to also represent COPC levels. A minimum of three rounds of comprehensive analysis is recommended. If a reliable correlation is not shown, a more intensive chemical constituent sampling program is needed.

Use of these options are important to address bullets 5 and 6, Section 1.2 Removal Action Objectives, and Section 2, ARARs. The Department welcomes discussion on these or other options, for developing the frequency and scope of COPC monitoring work.

(5) In addition, in response to former NJDEP comments on this issue, CPG states: "Monitoring of COPC will be conducted as a continuation of the baseline monitoring program." ... and " COPC water quality monitoring will be conducted as an extension of the baseline monitoring program and will be sampled/analyzed based on the frequency associated with this program." However, this provides little information on the program. As indicated above, the scope and details of the COPC monitoring during dredging and capping operations are needed.

(6) The forthcoming WQMP should include a summary of the 2009/2010 water column data from RM 10.2, as CPG plans to use this information to help form baseline conditions.

(7) CPG response to NJDEP comment 14c, Word comment 14 (RTC page 7) is confusing, however, it is anticipated this issue will be addressed in the forthcoming WQMP.

(8) CPG response to NJDEP comment 12, Word comment 15 (RTC, page 8) and Section 4.6.1.3, page 4-12:

a. The text establishes an early warning turbidity "trigger level" of 35 NTU above background. Given that the applicable NJ Surface Water Quality Standard for turbidity is a maximum of 50 NTU at any one time, it is recommended that this "trigger level" be set at a level no greater than 50 NTU. Since the average background turbidity levels in the project area are approximately 20 NTU (19.8 NTU, based on RM 10.2 data from 2009 and 2010; CPG Response to Comment #15), this would equate to about 30 NTU above background under "average" conditions (i.e. only 5 NTU less than that proposed in the Draft Final Design Report).

b. CPG propose an "action level" of 70 NTU above background, which equates to approximately 90 NTU, nearly 2x's the maximum standard of 50 NTU. If exceeded, dredging will be suspended. CPG Response to Comment #15 and the Draft Final Design Report do not provide any technical basis for this "action level". It is recommended that this action level be established based on the suspended sediment/turbidity and COPC correlation to be developed in the near future, to minimize potential impacts to surface water quality due to elevated chemical pollutant concentrations. CPG propose that monitoring for COPCs would be implemented when the "action level" is exceeded, however, the Draft Final Design Report does not discuss how this monitoring will be conducted. Otherwise, to be protective of surface water quality, dredging should be suspended when the turbidity "trigger level" (discussed above) is exceeded.

c. CPG propose that when the early warning "trigger level" is exceeded, dredging will continue and the BMPs listed in Section 4.4.3 (page 4-8) will be evaluated, apparently to determine the cause of the exceedance. However, based on CPG Response to Comment #10, it appears that no action will be taken unless the "action level" is exceeded. As described above, resolution of an appropriate action level for this project is needed.

The purpose of the "trigger level" should be to implement additional management actions and BMPs (beyond those listed in Section 4.4.3) to (1) prevent an exceedance of the "action level", and (2) reduce turbidity levels to below the "trigger level". CPG Response to Comment #10 lists some such additional management actions - these should be added to the Final Design Report and implemented (as needed) when the "trigger level" is exceeded.

The above comments also pertain to Appendix E, Section 31 23 24 - 3.01-E.

(9) CPG response to NJDEP comment 34 (RTC, page 11) - CPG states that there is sufficient dioxin/furan sediment data for disposal purposes. NJDEP agrees; the main point of the former comment was to ensure that appropriate dioxin/furan data are included in the waste profile documentation provided to the off-site facilities used for transporting, handling and disposing of this material. Neither the text of Section 8, nor Table 8-1, Composite Samples Waste Characterization Profile, provided dioxin/furan concentrations. The information in Table 3-1 should be used to represent this contaminant category to off-site facilities. Prior to TCRA implementation, NJDEP requests a copy of the complete waste profile documentation provided to the selected off-site facilities.

(10) CPG response to NJDEP Appendix K, general comment (RTC, page 14) - CPG's response does not address the specific recommendations provided; instead, CPG states; "The appendix will be revised to be consistent with the Final Design document." NJDEP re-iterates original comment; it is anticipated that these comments can be addressed in the forthcoming Appendix K.

(11) CPG response to NJDEP Appendix K comment 6 (RTC, page17) - NJDEP disagrees with the CPG response for long term monitoring frequency, for both physical and chemical monitoring. First, NJDEP's original comment referring to RM 10.9 physical conditions as a need for annual physical monitoring for the first 5 years (versus CPG proposal of every 5 years, in addition to event-based) was based on a number of factors, with the primary ones including the relatively higher sheer stresses and steep slopes in portions of the TCRA capping area versus elsewhere at RM 10.9, and the occurrence of higher frequency, higher intensity storms in recent years. If this were a lake, less frequent sampling may be appropriate. However, for this section of a tidal river near the confluence of another river (Third River), subject to flooding, and subject to high recreational water sports use, increased physical and chemical monitoring is justified and therefore recommended. Second, if, after a series of annual inspections, it is shown that the cap has held up well under these conditions, less frequent physical monitoring may be appropriate. The same may be determined after a good track record of chemical monitoring - - but the track records for both first need to be established through implementation of well-designed testing programs.

(12) CPG response to NJDEP Appendix K comment 11b (RTC page 19) - NJDEP disagrees with the response. Pre-remedial pore water quality is directly relevant to post remedial pore water quality for determining degree of capping success in isolating chemical constituents (i.e., are the design assumptions working?). Although surface water criteria are used for evaluation of surface water quality at the cap, the comparison of pre- and post -remedial *pore water data* shows degree of remedy success and is a more direct measure of cap integrity. CPG will have the data; why not use it not only for cap design, but for remedy success?

(13) CPG response to NJDEP Appendix K comment 11c (RTC page 19) - NJDEP disagrees with the response. Pre-remedial pore water sampling should include the primary contaminants of concern, not just the more mobile ones. For this project, Phenanthrene and Mercury were chosen, yet the purpose of this TCRA is to primarily address isolation of 2,3,7,8-TCDD and PCBs, among

other compounds (included Phenanthrene and Hg). For this reason, the key chemicals of concern should be tested for in the pre- and post- remedial pore water monitoring.

(14) CPG response to NJDEP Appendix K comment 14 (RTC page 20) - In response to specific NJDEP recommendations on improving Appendix K, (concerning long term monitoring design and cap maintenance triggers), the CPG provides a broad statement: "The objective of this removal action is "to reduce exposure of receptors to, and prevent potentially significant migration of contaminants from [the removal area]." The proposed plan will ensure that the risk of direct exposure is maintained and that COPCs beneath the cap are controlled from entering the bioactive zone of the cap following completion of the dredging/capping works." NJDEP comments are meant to assist development of specific measures to *ensure these objectives are met*, through development of monitoring programs that can either document remedy success, or identify areas of improvement, if necessary. It is anticipated that NJDEP comments can be addressed in the future version of the Long Term Monitoring Program.

(15) Appendix G, CHASP, Section 4.7, Air Monitoring - This section provides a good framework for the perimeter monitoring program needed for this project. However, additional details are needed for final approval. These include: sampling methods and analysis for each component of the program (indicated for some, but not all), the COPCs to be tested, number of sampling locations and locations of same, along with frequency of readings or sample collection (indicated for some, but not all) and listing of action levels (and trigger levels, if appropriate) and *basis for same* (including references), and parameter specific sample reporting limits (to be below action/trigger levels). In addition, a decision-tree or similar outline is needed for how testing results are to be assessed, along with resulting actions taken. Analysis for Dioxins/Furans should use T0-9A and analysis for PCBs/Pesticides, if selected for testing, should use T0-4A. The PAM should list all the specific testing equipment to be used for real-time measurements, and list or describe sample collection equipment to be used for samples sent for laboratory analysis. Laboratories used for this project are to have the appropriate certifications to perform the required testing. Odor observations should be linked with H2S monitoring. The Department welcomes discussion to shape the PAM.

Technical Comments/Questions

(1) Section 6.2.4, page 6-3: How will the stabilization operations be conducted if an in-barge processing system is used? [Also see Appendix G, Section 4.4]

(2) Section 7.1.2, page 7-2: This section states that a 500-year return flow evaluation was conducted - but the results of this evaluation are not discussed in the Draft Final Design Report. CPG Response to Comment #19 implies that the results of this analysis are included in Section 7.2.2.1, but the Draft Final Design Report does not include this section.

(3) Section 7.1.2.1, page 7-2 and Table 7-1: The formula from Palermo (1998) used in the Final Design Report calculates the D_{50} for the cap armor stone. However, Table 7-1 presents the "maximum calculated D_{50}" values for various depth intervals. How are these "maximum" values

related to the D_{50} sizes calculated using the Palermo (1998) equation? And how are these "maximum" D_{50} values used to determine the design size D_{50} for the armor stone?

If the data in Table 7-1 actually presents the results of the application of the Palermo (1998) equation (and not some "maximum" value), then it appears that the D_{50} for Armor Stone Type A (to be place at depths below -3.0 feet) should be greater than the design size of D_{50} = 4.5 inches. Likewise, it appears that the D_{50} for Armor Stone Type B (to be place at depths above -3.0 feet) should be greater than the design size of D_{50} = 2 inches.

(4) Section 7.1.1, page 7-2: This section briefly discusses the placement of an additional sand or "approved soil" layer on top of the cap armor; this operation is not addressed in Appendix E Section 02 32 00. Additional discussion concerning the purpose of placing this material, and how it will be placed, are needed. The use of sand or "soil" for such an operation will need the approval of NJDEP, and may require pre-placement chemical testing of the material.

(5) Section 7.1.4, page 7-4: One identified option for the active cap layer design is to mix the "chemical sequestering amendments" with the sand layer. This will apparently "create more favorable conditions for reduced diffusion and isolation of COPCs". Please explain how, for example, mixing activated carbon into the sand layer will reduce COPC diffusion compared to a solid layer of activated carbon placed on top of the sand layer; this appears to be counterintuitive, since the activated carbon particles will be dispersed throughout the sand (unless a much larger mass of activated carbon is used when mixed in the sand layer).

Also, note that Appendix E, Section 02 32 00, 1.02-B states that "the active material will be placed on top of the 6 inch thick sand layer", and (together with sub-section 2.02) will consist of a specified type of activated carbon. [Also see Appendix G, Section 1.2.3.1 and Section 4.6]

The Draft Final Design Report and the appropriate appendices should be revised to be consistent with the final cap design.

(6) Section 7.1.6, page 7-6: This section references a Figure 7-2, but this figure was not included in the Draft Final Design Report.

(7) Section 8.2, page 8.4: This section states that additional sediment sampling and TCLP analyses must be conducted. Are these the activities implemented by the CPG in early 2013, or future sampling?

(8) Section 8.4, page 8-4: The treatment and disposal of the "excess barge water" are not discussed. CPG/USEPA Response to Comment #48 notes that filtering this water prior to offsite treatment/disposal has been considered, but this is not discussed in the Draft Final Design Report.

(9) Appendix E (previous Appendix D), Section 01 45 16, Part 1 - 1.01-B: This section and CPG Response to Comment #35 state that separate surface water quality monitoring programs are to be implemented by the CPG and dredging subcontractor. This section of Appendix E provides an "outline" of the subcontractor's program - the detailed monitoring plan to be submitted to CH2M Hill (Section 1.02-A-1) should also be submitted to the NJDEP for its review and approval. From this

"outline", it appears that the subcontractor will be implementing the surface water quality monitoring program presented in the Final Design Report; if this is the case, what monitoring program will the CPG implement?

(10) Appendix E (previous Appendix D), Section 31 23 24, Part 1 - 1.01-C and 1.06-A-1-1: Please provide details of the controls/BMPs to be used to minimize the discharge of sediment and water from the barges during dredging operations and transport of the barges to the unloading facility. [Also see Appendix G, Section 4.3]

(11) Appendix G, Section 4, page 4-1: This section states that the monitoring activities presented in this section are a "summary of the details" included in Appendix I - but a review of the table of contents in the appendix did not identify any specific sections that address monitoring.

(12) Appendix G, section 4.8, page 4-6: River flow conditions that would result in a suspension of dredging and capping activities should also be noted. This section also references Appendix F - but a review of the table of contents in the appendix did not identify any specific sections that address weather-related conditions that would result in a suspension of work.

Issues to Be Addressed in the Future/Other Documents

(1) Silt Curtain - Design and Operation (Section 4.4.4, page 4-9 and Figure 4-7): CPG Response to Comment #11 states that the dredging subcontractor's Dredge and Operation Plan will include the means and methods to install the silt curtains. This plan should also include provisions to minimize the dispersal of suspended sediment (SS) contained by the curtain during its removal - a maximum SS/turbidity level should be established, such that the curtain will not be removed until the SS level within the curtain has fallen below this level. [Also see Appendix E, Section 31 23 34, 1.06-A-1-a and 2.03.]

(2) Water Quality Monitoring - SS/Turbidity and COPC Correlation (Section 4.6.1, page 4-11): In order to be fully protective of surface water quality, the correlation between SS/Turbidity (measured during routine monitoring operations) and COPC concentrations should be established. CPG Response to Comment #13 appears to state that RM 10.2 data collected in 2009 and 2010 will be initially used to do this - but also states that "The locations and frequency of the COPC sampling are being developed." The process to be used to develop the SS/Turbidity-COPC correlation should be more clearly presented and provided to NJDEP for its review prior to the initiation of dredging operations.

(3) Water Quality Monitoring - Adaptive Management: CPG Response to Comment #14 states that the WQMP will include "an appropriate decision management tool ... to assess the TSS-turbidity water quality monitoring data ..." It is also stated that "the text [presumably of the Draft Final Design Report] has been revised to indicate that a WQMP will be developed and utilized for the management of dredging operations." However, the preparation of a WQMP (or Dredge and Operation Plan) are not addressed in the Draft Final Design Report (but see Appendix E, Section 01 45 55, Part 1 - 1.06-A and 1.06-D).

(4) Water Quality Monitoring - Methods and Data Quality Objectives: Additional detail is needed concerning the implementation of the surface water quality monitoring program; these are presumably to be included in the WQMP to be prepared for the project (see CPG Response to Comment #4).

(5) Stabilized Dredged Material - Transportation Best Management Practices (Section 8.3, page 8-4): The mode(s) of transport for the stabilized dredged material (and barge decant water) to its disposal (treatment) facility has not been finalized. Thus, it is not possible to fully evaluate the potential impacts of this transport or to develop BMPs to minimize these impacts. These issues must be addressed and provided to NJDEP for its review prior to the initiation of dredging operations. [Also see Appendix G, Section 1.2.4 and Section 4.5]

(6) Section 7.1, page 7-1 and Section 7.5.1, page 7.9: Additional field work is to be conducted in April 2013 to determine upward seepage velocity and pore water COPC concentrations in the project area. The thickness of the active layer (including a Reactive Core Mat, if used) will be determined once the design of the active layer is finalized.

(7) Section 7.4, page 7-8: The methods and equipment to be used to place the cap will be determined by cap placement contractor. A plan that details the cap placement operations should be developed and provided to NJDEP for its review prior to the initiation of capping activities. [Also see Appendix E Section 02 32 00; Appendix G, Section 1.2.3.2]

(8) Section 7.9, page 7-12: A long-term cap monitoring and maintenance plan is to be developed; this plan should be provided to NJDEP for its review. [See previous NJDEP comments on Appendix K in the Pre-Design Report (dated November 30, 2012)]

(9) Appendix G, Section 5.2 - It is noted that CPG indicates that Noise Limits and Monitoring will be addressed/resolved with NJDEP.